Date=14/08/2020
Lecture By=Shubham Joshi
Subject ⇒Questions regarding Trees

IN PREVIOUS LECTURE **(QUICK RECAP) Date-13/08/2020**	**In Today's Lecture (Overview)**
Question=1Given A Binary tree Find Leaf Nodes In It Question=2Write A program to find the height of the binary tree Question 3 Given a binary tree, return all root-to-leaf paths. MCQs Questions for self practice // CC For the day	Only One Question Was discussed In Today's Lecture Question = Level Order Traversal ⇒ What Is BFS In Python?? MCQs Questions For Self Practice\ CC And Assignment For the day

Question = Level Order Traversal

Given a binary tree, return the level order traversal of its nodes' values. (ie, from left to right, level by level).

For example:

Given binary tree [3,9,20,null,null,15,7],

```
    3
   / \
  9  20
    /  \
   15   7
```

return its level order traversal as:

```
[
  [3],
  [9,20],
```

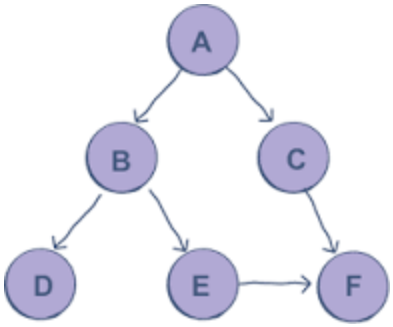
[15,7]]

Solution

```
# Definition for a binary tree node.
# class TreeNode:
#     def __init__(self, val=0, left=None, right=None):
#         self.val = val
#         self.left = left
#         self.right = right
from collections import defaultdict
class Solution:
    def levelOrder(self, root: TreeNode) -> List[List[int]]:
        if root is None:
            return []
        d=defaultdict(list)
        queue = []
        level=0
        queue.append((root,level))

        while(queue):
            node,l=queue.pop(0)
            d[l].append(node.val)
            level=l+1

            if node.left:
                queue.append((node.left,level))

            if node.right:
                queue.append((node.right,level))

        k=list(d.values())
        return k
```

⇒ What Is BFS In Python??

Breadth-first search (**BFS**) is an algorithm used for tree traversal on graphs or tree data structures.
BFS can be easily implemented using recursion and data structures like dictionaries and lists.



MCQs

1.**What is the best time complexity of level order traversal of the binary tree ?**

O(logn)

O(n)

O(n2)

2.**What is level order traversal of a tree called?**

DFS

BKS

BFS

3.**what is the space complexity of level order traversal using bfs ?**2

O(N)

O(N2)

O(NLOGN)

4.**What will be output of the following q = Queue() q.push(1) q.push(2) q.push(-1) q.pop()**

2

1

-1

Questions For Self Practice\ CC And Assignment For the day

Q1. https://practice.geeksforgeeks.org/problems/sum-of-binary-tree/1
Q2. https://practice.geeksforgeeks.org/problems/delete-keys-in-a-linked-list/1
Q3.https://leetcode.com/problems/binary-tree-level-order-traversal/